AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Previously Presented) An address protocol for forwarding a message packet from a source node to a destination node along a sequence of communicatively coupled nodes functioning as a linear chain network, the address protocol comprising:

a relative source address field programmed with an initial value at the source node corresponding to a destination node that is a preselected number of nodes away from the source node along the linear chain network; and

a counter that is incremented by a preselected step in value at each node the message packet is forwarded to along the chain network until the counter reaches the initial value, thereby indicating that the destination node has been reached,

wherein the destination node does not require address information in addition to the counter reaching the initial value to accept the message packet.

2. (Original) The protocol of Claim 1, further comprising an identifier field containing an identifier to identify the message packet as having a relative address protocol.

3. (Original) The protocol of Claim 2, further comprising a relative source destination field containing the initial value.

4. (Original) The protocol of Claim 1, further comprising a relative source destination field containing the initial value.

5. (Currently Amended) An address protocol for forwarding a message packet from a source node to a destination node along a sequence of communicatively coupled nodes functioning as a linear chain network, the address protocol comprising:

an identifier field containing an identifier to identify the message packet as having a relative address protocol;

a relative source address field programmed with an initial value at the source node corresponding to a destination node that is a preselected number of nodes away from the source node along the linear chain network; and

a counter that is ~~adjusted~~ incremented by a preselected step in value at each node the message packet is forwarded to along the linear chain network until the counter reaches the

initial value, thereby indicating that the destination node has been reached,

wherein the destination node does not require address information in addition to the counter reaching the initial value to accept the message packet.

6. (Canceled)

7. (Previously Presented) The protocol of Claim 5, wherein the initial value is an integer having an absolute value equal to the desired number of node hops and the counter is incremented by a step in value of one at each node.

8. (Canceled)

9. (Currently Amended) The protocol of Claim 7, wherein the counter ~~has an initial value of~~ is initially set to zero and the counter is counted up by one at each node hop until the initial value is reached.

10. (Original) The protocol of Claim 5, wherein the initial value is a linear function of the desired number of node hops.

11. (Original) The protocol of Claim 5, wherein at least one node in the linear chain is a regenerator element.

12. (Original) The protocol of Claim 5, wherein the chain network is a virtual chain network.

13. (Original) The protocol of Claim 5, wherein the chain network comprises a portion of a ring network.

14. (Previously Presented) A method of sending a message packet along a portion of a network functioning as a linear chain network from a source node to a destination node using an address protocol having an identifier to identify the message packet as having a relative address protocol, a relative source address field for storing an initial value, and a counter, the method comprising the steps of:

selecting the initial value to be a function of a desired number of node hops along the linear chain network from the source node;

programming the relative source address field to have the initial value;

incrementing the counter by a preselected step in value at each node that the message packet is forwarded to; and

accepting the message packet at a destination node when the counter value reaches the initial value, without requiring address information in addition to the counter reaching the initial value to accept the message packet,

wherein the preselected step in value is chosen so that the counter reaches the initial value when the packet has completed the desired number of node hops.

15. (Previously Presented) The method of Claim 14, wherein the message packet comprises a status query message and further comprising the steps of:

requesting the destination node to send a status message packet having a second relative source address field and a second counter in a direction along the chain back to the source node;

programming the second relative source address field to have the initial value;

incrementing the second counter by the preselected step in value at each node that the message packet is forwarded to; and

accepting the status message packet when the counter reaches the initial value,

wherein the status message packet is returned to the source node.

16. (Original) The method of Claim 15, wherein at least one of the nodes of the chain includes a regenerator element.

17. (Previously Presented) The method of claim 15, further comprising the steps of:

selecting a return message;

transmitting the return message in the direction to the source node;

incrementing the second counter by the preselected step in value at each node that the message packet is forwarded to; and

accepting the return message packet at the source node when the second counter reaches the initial value.

18. (Previously Presented) A method of sending a message packet along a chain network having regenerator nodes from a source node to a destination node using an address protocol having an identifier to identify the message packet as having a relative address protocol, a relative source address for storing an initial value, and a counter, the method comprising the steps of:

selecting the initial value to be a function of a desired number of node hops along the linear chain from the source node;

incrementing the counter by a preselected step in value at each node that the message packet is forwarded to; and

accepting the message packet at a destination node when the counter value reaches the initial value, without requiring address information in addition to the counter reaching the initial value to accept the message packet,

wherein the preselected step in value is chosen so that the counter reaches the initial value when the packet has completed the desired number of node hops.

19. (Previously Presented) The method of Claim 18, wherein the message packet comprises a status query message and further comprising the steps of:

requesting the destination node to send a status message packet having a second relative source address field and a second counter back to the source node;

programming the second relative source address field to have the initial value;

incrementing the second counter by the preselected step in value at each node that the message packet is forwarded to; and

accepting the message packet when the second counter reaches the initial value,

wherein the status message packet is returned to the source node.

20. (Previously Presented) The method of Claim 19, further comprising the steps of:

sending a plurality of the status query messages to a plurality of destination nodes, the destination nodes corresponding to different initial values indicating that the destination nodes are each a different number of node hops from the source node;

receiving the status message packets from responding destination nodes; and

determining the relative distance of responding nodes as a function of the initial value corresponding to each responding node,

wherein a fault is isolated to a part of the network subsequent to the responding active node the greatest number of node hops from the source node.

21. (Previously Presented) The method of Claim 14, further comprising the step of:

detecting a fault in a linear chain of regenerator nodes using the relative address protocol by:

sending a first status query message packet requesting a return status message from a destination node at least one node hop from the source node; and

sending at least one subsequent status query message packet requesting a return status message from another destination node corresponding to a different number of node hops from the source node and recording whether the return status message is received at the source node; and

determining the node the greatest number of node hops from the source node replying to the status query message directed to it,

wherein a fault is isolated to a portion of the chain network subsequent to the node the greatest number of node hops from the source node returning the corresponding status message.